WHAT IS CLAIMED IS:

1. A method of sharing multiple resources among multiple requesters using an arbiter, comprising:

receiving requests for the multiple resources from the multiple requesters;

determining respective request priorities corresponding to respective requests for respective resources made by respective requesters, each request priority being determined according to at least one of a requester priority and a resource priority, requester priority being inversely related to a number of requests made by a particular requester, resource priority being inversely related to a number of requests made for a particular resource; and

allocating at least some of the resources according to request priorities.

2. The method as recited in claim 1, wherein at least one of the requesters is requesting multiple ones of the resources.

3. The method as recited in claim 1, wherein at least one resource is requested by multiple requesters.

4. The method as recited in claim 1 further comprising allocating at least one of the resources to one of the requesters according to a round robin scheme.

5. The method as recited in claim 1 wherein the arbiter using the round robin scheme during an arbitration cycle in which all requests for all resources are considered, attempts to allocate at least one resource according to the round robin scheme prior to allocating resources according to request priority, thereby preventing starvation.

6. The method as recited in claim 4 wherein the round robin scheme considers multiple requests before allocating resources according to request priority.

7. The method as recited in claim 1 wherein priority is assigned to at least each requester making a request according to requester priority for each arbitration cycle.

8. The method as recited in claim 1 wherein priority is assigned to at least each requested resource according to resource priority for each arbitration cycle.

9. The method as recited in claim 1 wherein assigning priorities further comprises:

combining resource priority and requester priority to generate an assigned priority for each combined requester and resource priority.

10. The method as recited in claim 1 wherein the requesters are input ports of a network switch and the resources are output ports of the network switch, multiple ones of the output ports being accessible to more than one of the input ports.

11. The method as recited in claim 1 wherein the requesters are processors of a multi-processor system and the resources are memories coupled to the processors, each of the memories being accessible to more than one of the processors.

12. The method as recited in claim 1 further comprising recalculating priorities after each time a resource is allocated.

13. A method for allocating multiple resources to multiple requesters, comprising:

receiving requests for the multiple resources from the multiple requesters; and

allocating respective resources to respective requesters according to priorities determined by at least one of a number of requests made by each requester and a number of requests directed to each of the resources.

14. The method as recited in claim 13 further comprising allocating the respective resources to the respective requesters according to a starvation avoidance mechanism.

15. An arbitration apparatus for arbitrating requests from a plurality of requesters for a plurality of resources, comprising:

means for receiving requests for resources from the requesters; and

means for allocating requests according to at least one of requester priority and resource priority.

16. The arbitration apparatus as recited in claim 15 further comprising:

means for determining requester priority for each respective requester according to a number of requests made by the respective requesters, the requester priority being inversely related to the number of requests.

17. The arbitration apparatus as recited in claim 15 further comprising:

means for determining resource priority for respective resources according to a number of requests made for the respective resources, the respective resource priorities being inversely related to the number of requests made for the respective resource.

18. The arbitration apparatus as recited in claim 15 further comprising means for preventing starvation for requests.

19. An apparatus comprising:

a transport mechanism attached to a plurality of resources and a plurality of requesters;

an arbiter coupled to receive a plurality of requests from the requesters, each of the requests at least one of the resources, the arbiter allocating resources to requesters according to at least one of a requester priority and a resource priority, the requester priority and the resource priority being inversely related to, respectively, a number of requests for resources made by respective requesters and a number of requests directed to respective resources.

20. The apparatus as recited in claim 19 wherein the arbiter further includes a round robin mechanism to allocate resources to requesters.

21. The apparatus as recited in claim 19 wherein the requesters are processors, the resources are memories, each of the memories being coupled to multiple ones of the processors and the transport mechanism is a plurality of buses coupling the processors to the memories.

22. The apparatus as recited in claim 19 wherein the requesters are input and output nodes of a network and the transport mechanism is a switch.

23. A method of sharing multiple resources among multiple requesters using an arbiter, comprising:

receiving requests for the multiple resources from the multiple requesters; and

allocating resources among the requesters as a function of a number of requests made.

24. The method as recited in claim 23 wherein the function of the number of requests utilizes how many requests are made by each requester.

25. The method as recited in claim 23 wherein the function of the number of requests utilizes how many requests made for each resource.

26. The method as recited in claim 23 wherein the function of the number of requests utilizes a combination of how many requests made for each resource and how many requests are made by each requester.

27. A computer program product encoded in at least one computer readable medium to implement an arbitration mechanism to allocate multiple resources among multiple requesters, the computer program product comprising:

code executable to receive requests for the multiple resources from the multiple requesters; and

code executable to allocate respective resources to respective requesters according to priorities determined by at least one of a number of requests made by each requester and a number of requests directed to each of the resources.

28. The computer program product as recited in claim 27 wherein the computer program product further includes code to implement a starvation avoidance mechanism.

29. The computer program product as recited in claim 27, wherein the at least one computer readable medium is selected from the set of a disk, tape or other magnetic, optical, or electronic storage medium and a network, wireline, wireless or other communications medium.